# User Manual

## ALPHACallisto
## Discrete Inputs

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# REVISIONS

| Date | Rev # | Auteur | Description |
|---|---|---|---|
| 18/07/2007 | 1.0 | A.C. | Document creation |
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# 1- DI Step by step

**1** **Install ALPHACallisto modules**

- Set a distinct address on each module with 01 for master
- Set the operating mode on master module
- Connect ALPHACallisto to signs, dry contacts and PWS

**2** **Install software and driver**

- Install ALPHANet PRO software (v1.3.a or upper)
- Connect ALPHACallisto to PC via USB or COM port
- Install driver if USB is used

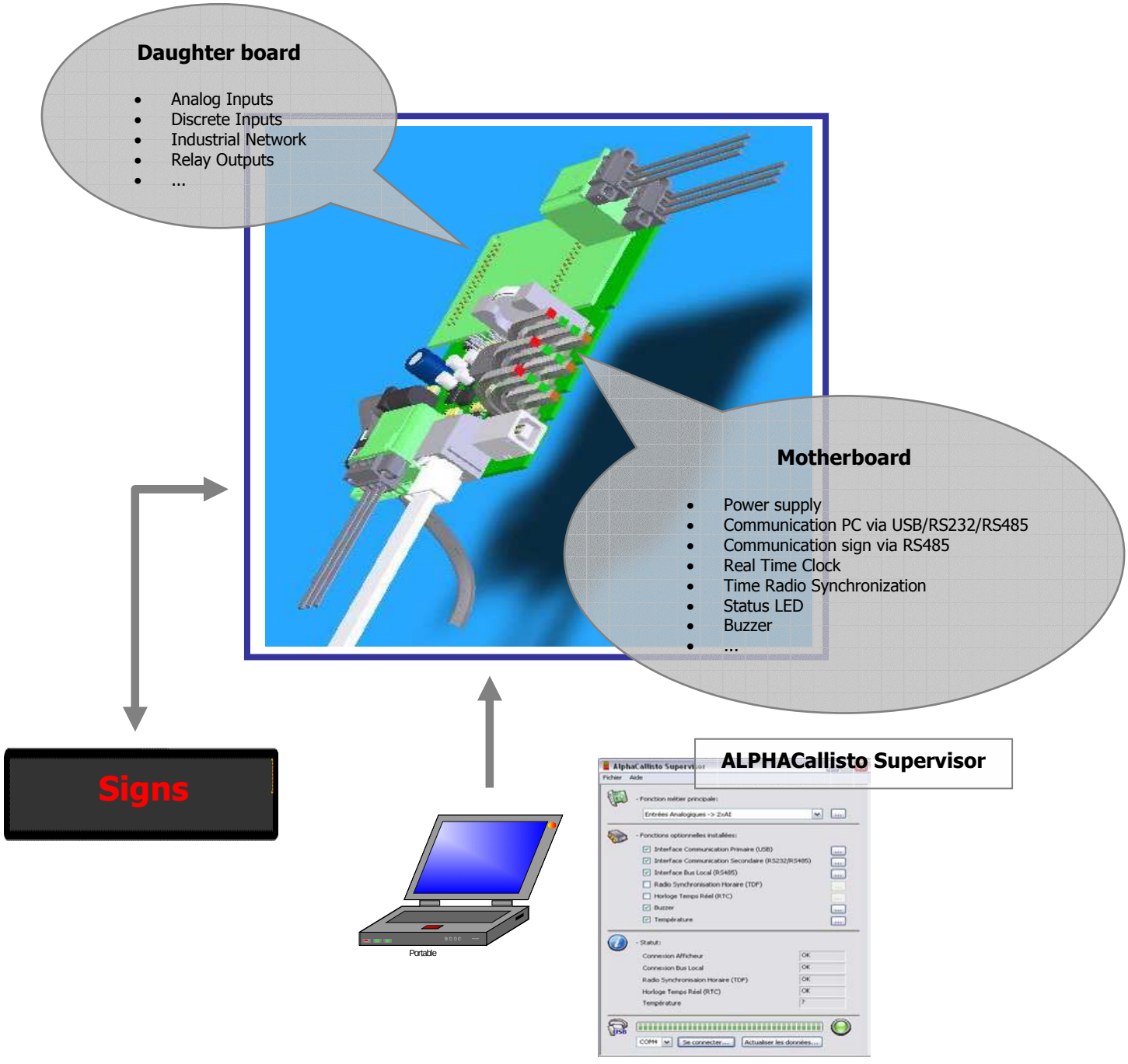
**3** **Download messages on signs**

- Create your messages with ALPHANet PRO
- Download them on sign

# 2- INTRODUCTION

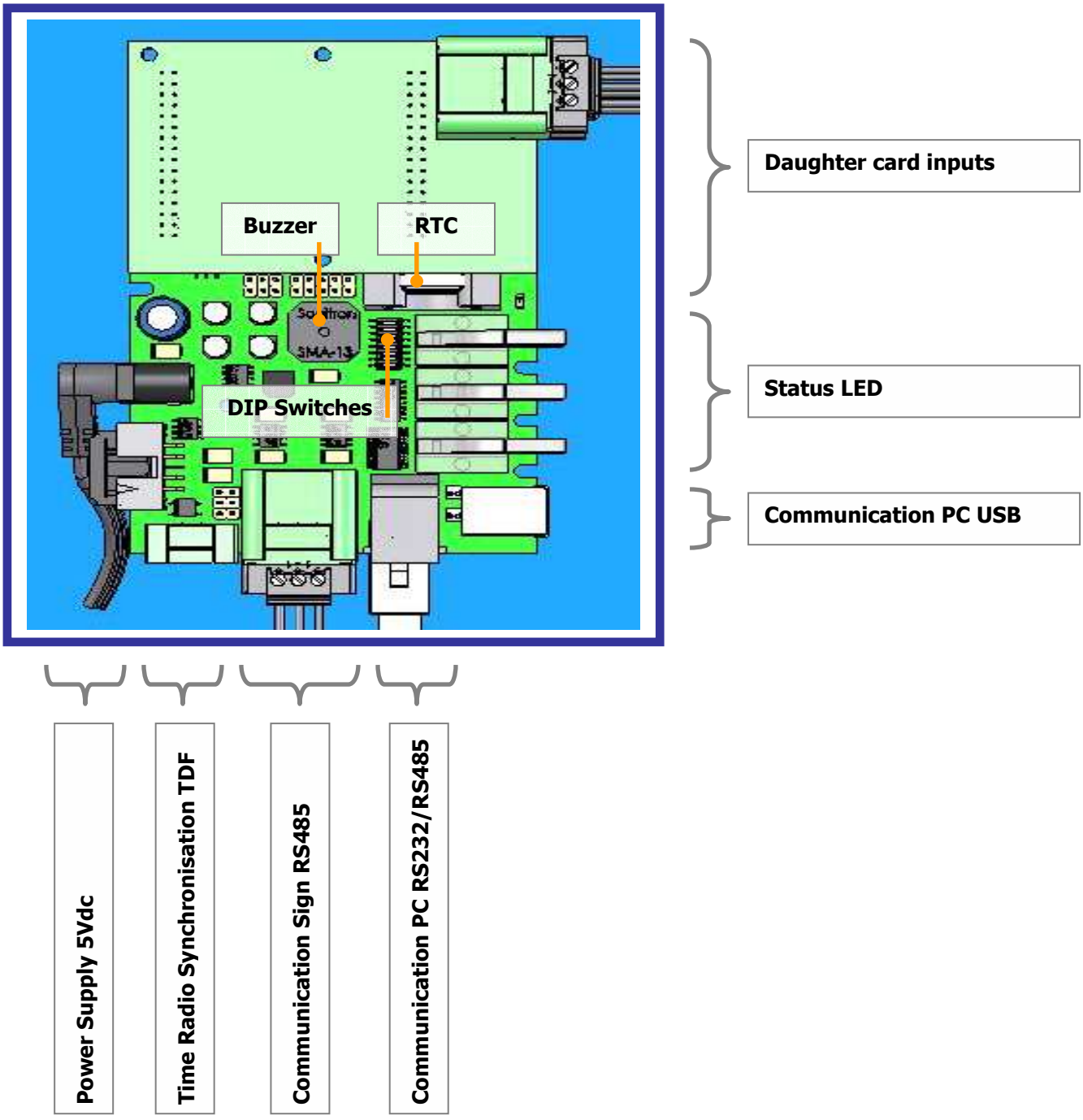
The **ALPHACallisto** product is a multipurpose interface that has been specially developed to answer the needs of the industry market. It principle of working is to collect different data coming from PLC or from sensor (dry contacts, analog inputs, temperature…) in order to activate messages and to refresh variables on **ALPHA** sign.

## 2.1- General synoptic



## 2.2- Hardware architecture

The hardware architecture of interface consists of two parts. The first one is the mother board that embeds all most common used functions and the second one the daughter board that embeds the specific function.




All configuration parameters are saved in **FLASH** memory. They can be upgraded with **ALPHACallisto Supervisor** software at any time to reconfigure the system.
The **ALPHACallisto** interfaces can be plugged together (up to 8) in order to increase the input number, ability and function.

# 2.3- Discrete Inputs

The **ALPHACallisto Discrete Input** interface allows messages to be displayed on standard ALPHA electronic signs. Indeed it is possible by using simple on/off dry contacts to trigger messages and to refresh variables that have been stored in a sign. Moreover the ALPHA Discrete Input Interface is designed for low-voltage applications.

Messages to be displayed are stored in a sign using either:

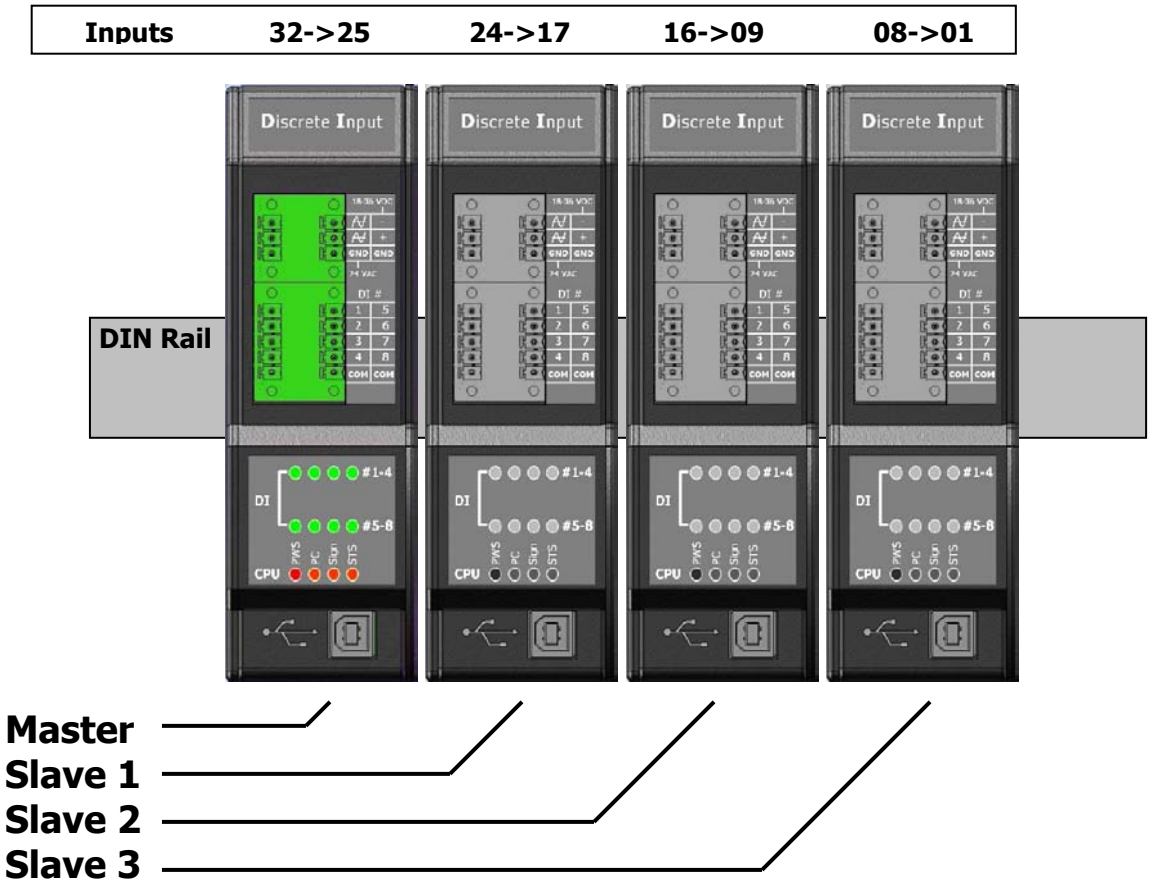
- Infrared handheld remote control
- Adaptive software such as **ALPHANet PRO** software (see **ALPHANet PRO** manual)

By using one to four modules the ALPHACallisto can be connected up to 32 dry contact inputs.

As long as the ALPHACallisto Supervisor software is not upgraded for Discrete Inputs, most common operating modes are only configurable by DIP switches (see *"Operating Modes"*):

- Mode 1: Binary
- Mode 2: Binary Coded Decimal (BCD)
- Mode 3: Momentary Triggered
- Mode 4: Discrete Fixed
- Mode 5: Counter
- Mode 6: Binary variable
- Mode 7: BCD variable

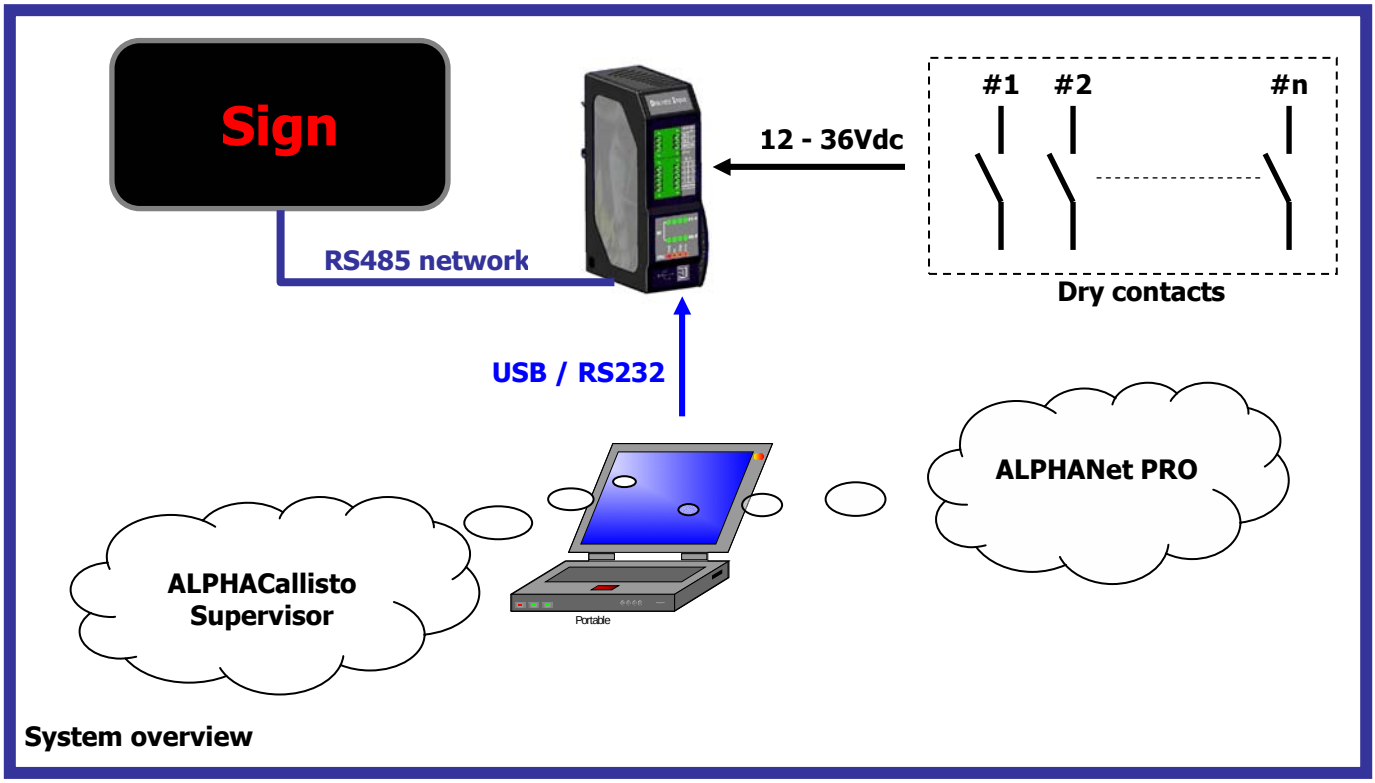
Only one of seven available operating modes can be configured on a same system.



# 3- Connection & LED

## 3.1- System overview

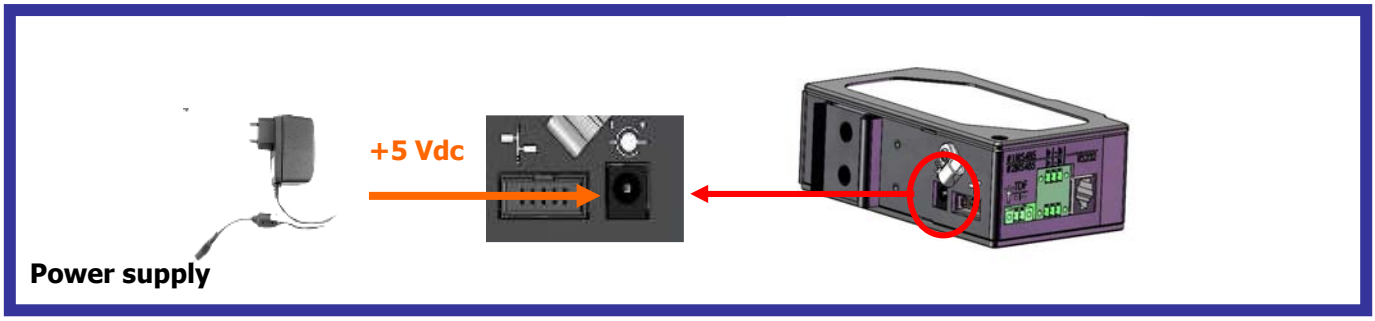
- **ALPHACallisto** is connected to **PC** via **USB** or **RS232** in order to configure module and to download messages on signs.
- **Signs** are connected to ALPHACallisto on a **RS485** network.
- System manages up to **32 inputs** by connecting 4 modules together.
- Discrete inputs are dedicated for **low voltage application** (12 to 36Vdc/Vac).




System overview

## 3.2- Power supply

The ALPHACallisto is powered by an adapatator 230Vac/5Vdc – 1100 mA (supplied by AMS).
The status LED PWS allows seeing if the module is powered.

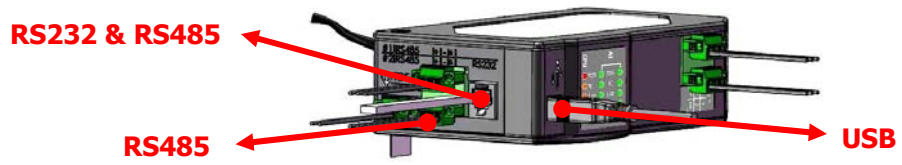



Power supply

**Note:** In multi-module operating, only one module needs to be powered (the master module most general).

## 3.3- Connection PC to Module

This connection allows downloading messages on sign with **ALPHANet PRO** and configuring Module with **ALPHACallisto supervisor**. It can be achieved by three bus type: USB, RS232 & RS485.
The status LED PC allows seeing if the module is communicating with the PC.



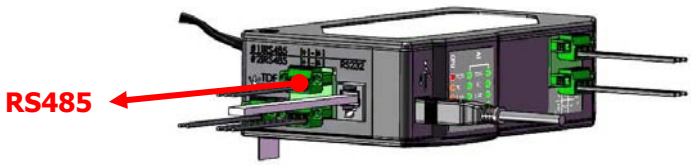

**Connection PC to module**

**Note:** In case USB is used, driver installation is requested. For an RS232 connection a crossed cable has to be used.

**Note:** In multi-module operating PC is only connected to the master.

## 3.4- Connection Module to Sign

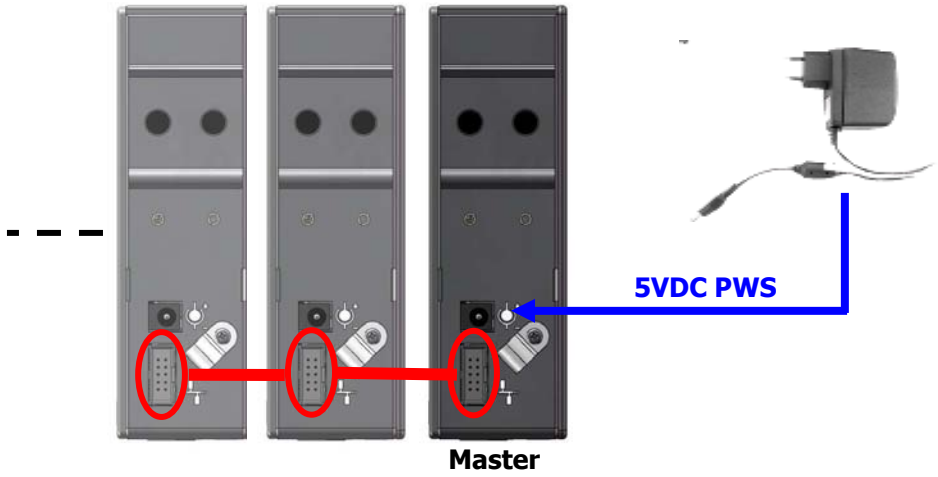
This connection is only achieved trough a RS485 bus.
The status LED SIGN allows seeing if the module is communicating with the PC.




**Note:** In multi-module operating sign is only connected to the master.

## 3.5- Connection Module to Module

In case of a multi-module application the slave and master ALPHACallisto modules are connected together via a RS485 bus available on HE 10 connector.

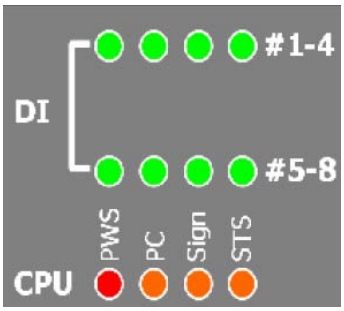



**Connection Module to Module**

**Note:** Only one module needs to be powered (the master module most general).

## 3.6- Status LEDs

The status LEDs allows checking the system state.




| LED | Description |
|---|---|
| **LED PWS** | Module is powered |
| **LED PC** | Module is communicating with PC |
| **LED SIGN** | Module is communicating with sign |
| **LED STS** | Pass through mode (PC communicate directly with sign) |
| **LED DI 1** | Input 1 is active |
| **LED DI 2** | Input 2 is active |
| **LED DI 3** | Input 3 is active |
| **LED DI 4** | Input 4 is active |
| **LED DI 5** | Input 5 is active |
| **LED DI 6** | Input 6 is active |
| **LED DI 7** | Input 7 is active |
| **LED DI 8** | Input 8 is active |

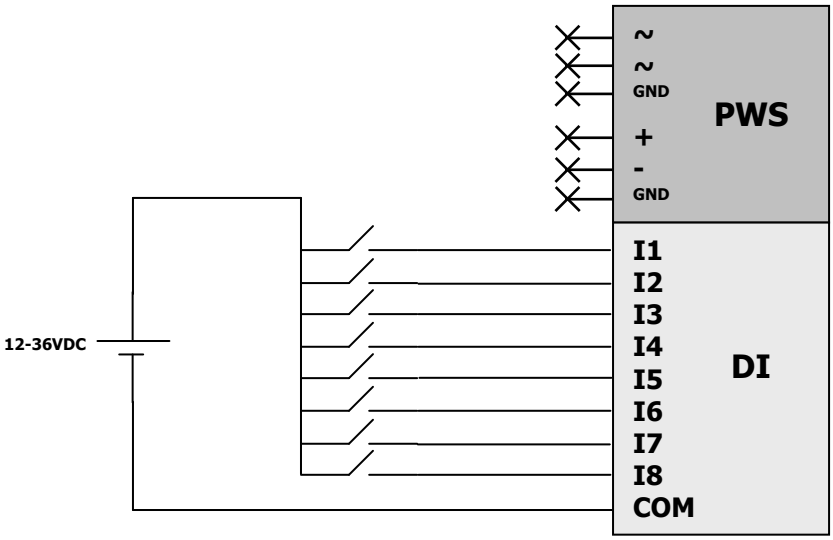
**Status LEDs**

# 4- Discrete Inputs setup

## 4.1- Dry contact type

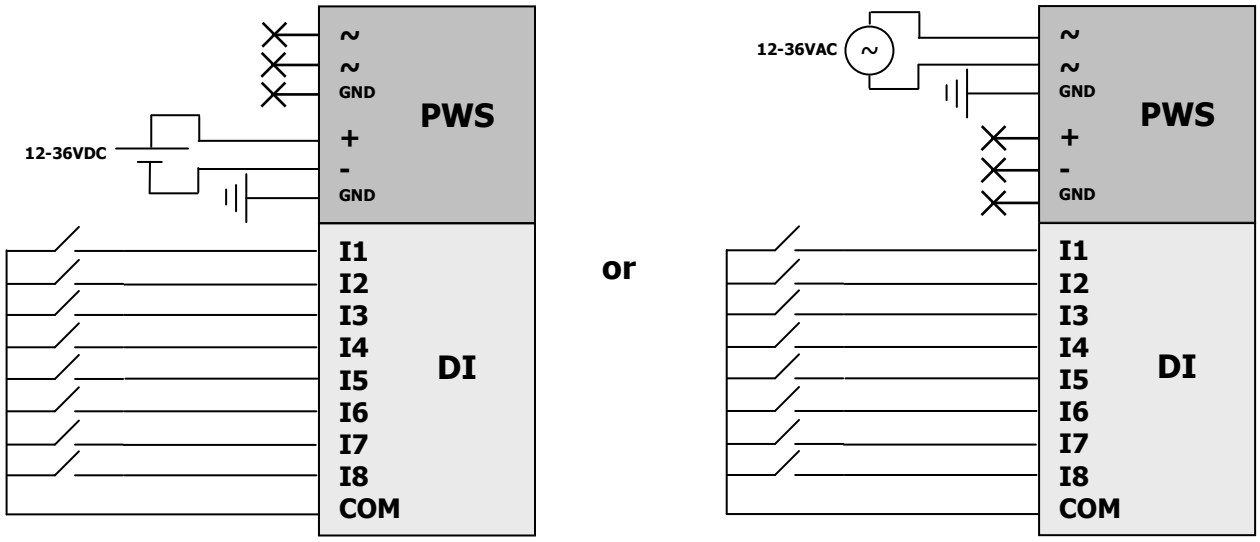
### 4.1.1- Sourcing (PNP)

In this configuration the power supply (12-36Vdc) is directly connected on the switches that pull the inputs up during a push. Inputs are active when contacts is closed.




### 4.1.2- Sinking (NPN)

In this configuration the power supply (12-36Vdc/Vac) is connected on the module and switches pull the inputs down during a push. Inputs are active when contacts is closed.



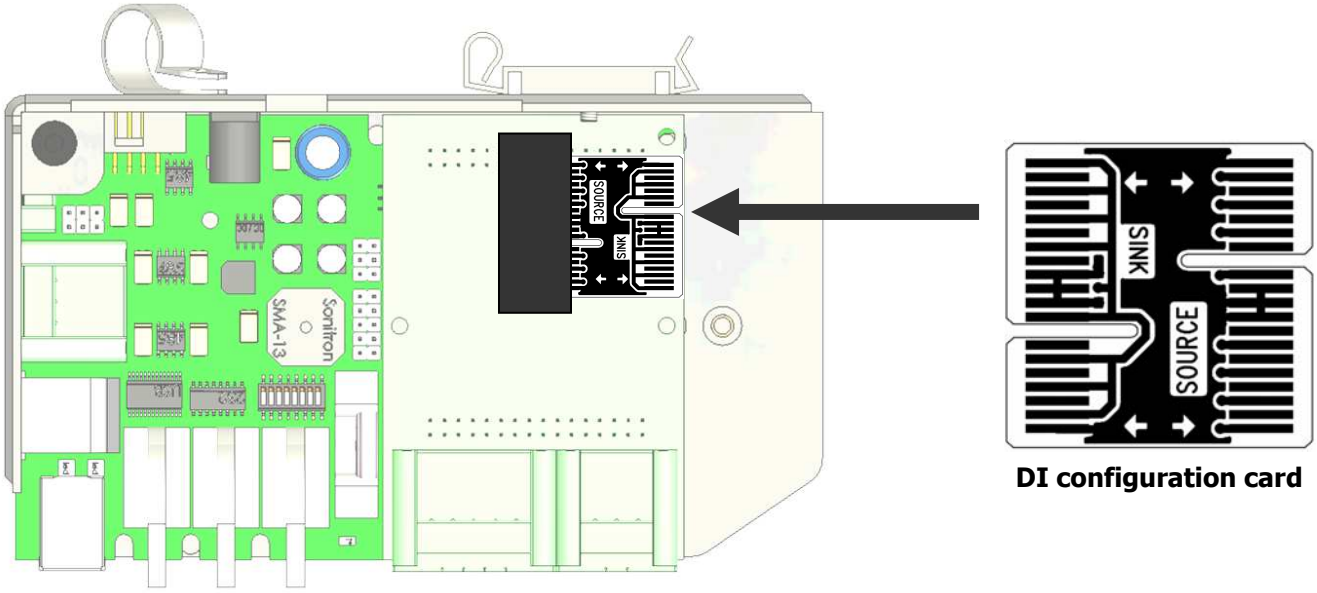

**Note:** When more than one module is used, all PWS of each module have to be interconnected.

# 4.2- Setup module

## 4.2.1- Dry contact type

To setup the dry contact type:

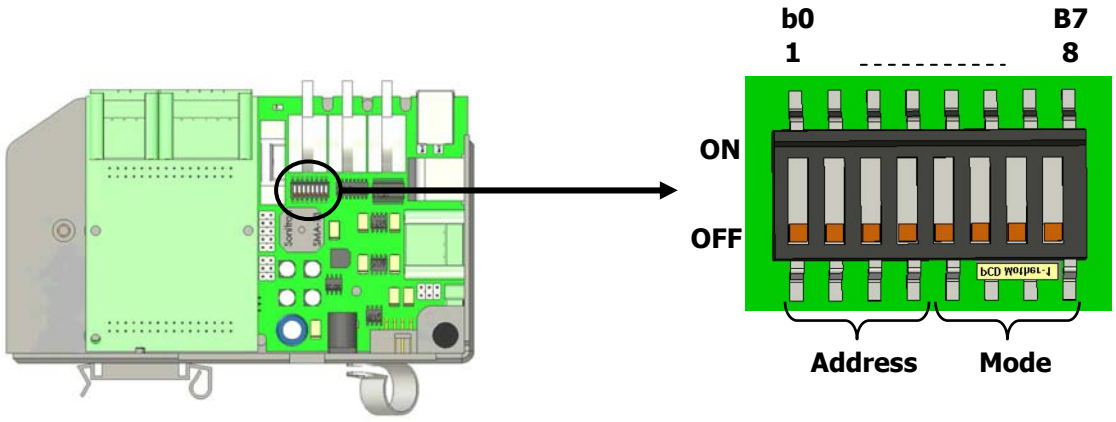
- Open the enclosure of ALPHACallisto
- Insert the **DI configuration card** in the corresponding way (Source / Sink).



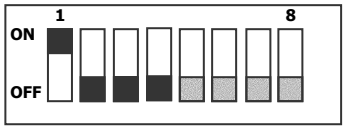
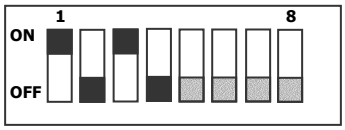
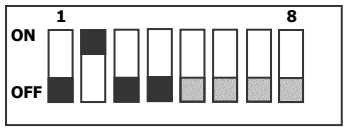
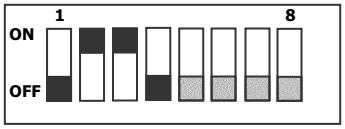
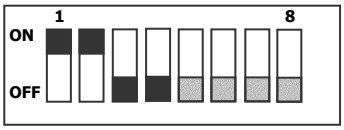
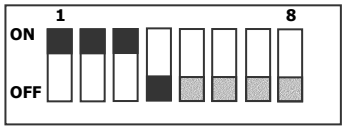
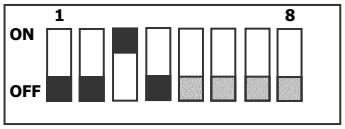
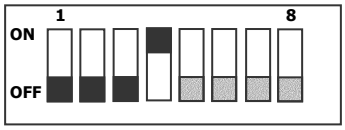

**DI configuration card**

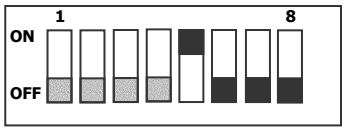
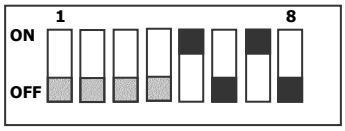
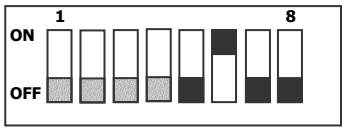
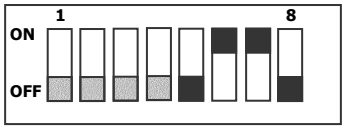
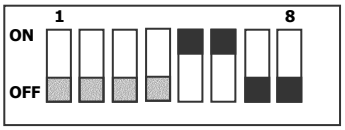
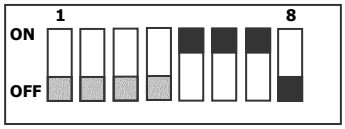
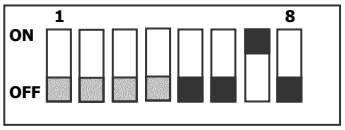
## 4.2.2- Address & Mode

The address of module is set on four first DIP switches (located on motherboard). The less significant bit is mapped on the first DIP switch.



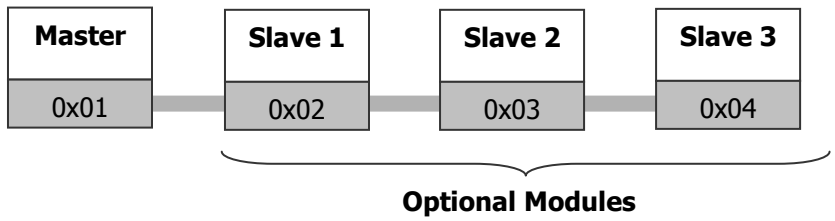

**DIP switches configuration**

| Address | | | |
|---|---|---|---|
| **0x01** (Master address) |  | **0x05** |  |
| **0x02** |  | **0x06** |  |
| **0x03** |  | **0x07** |  |
| **0x04** |  | **0x08** |  |

| Modes | | | |
|---|---|---|---|
| **Binary** |  | **Counter** |  |
| **BCD** |  | **Binary variable** |  |
| **Momentary Triggered** |  | **BCD variable** |  |
| **Discrete Fixed** |  | | |

# 4.3- ALPHACallisto network

According to the operating mode, it is possible to connect several ALPHACallisto modules together.




**ALPHACallisto network**

## 4.3.1- Alone configuration

When only one module is used:

- **Address** module has to be 0x01
- **Operating mode** has to be set (see "Operating modes").
- Sign and PC has to be connected to module

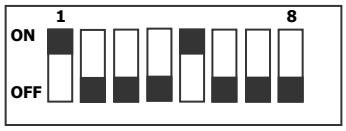
## 4.3.2- Master and slave configuration

When 2 and more modules are used:

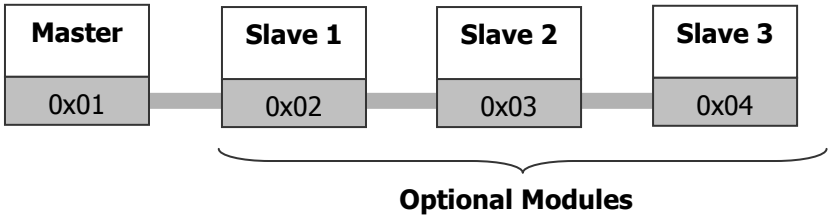
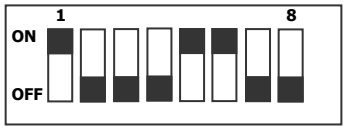
- **Master** has to be configured with address 0x01.
- **Slaves** have to be configured with distinct address 0x02 to 0x08.
- **Operating mode** has to be set only on master module (see "Operating modes").
- Sign and PC has to be connected to master module.
- All slaves have to be linked together and with the master.
- Only one adaptor (plugged on master) is need to powered the system

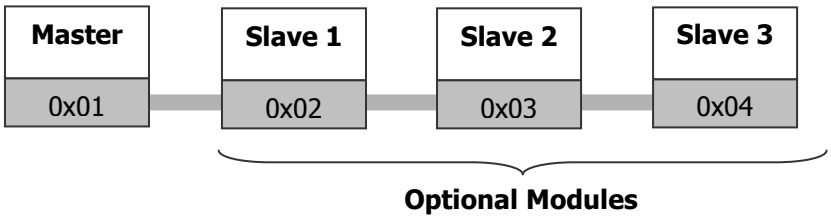
# 4.4- Operating modes

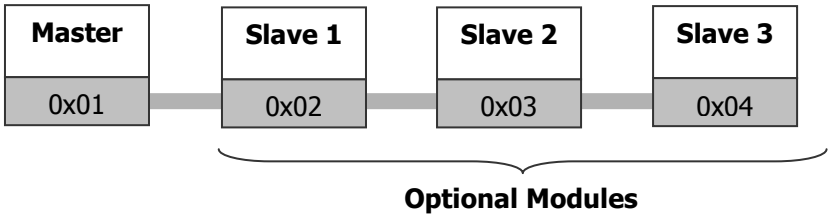
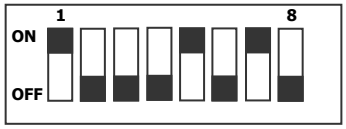
Because the **ALPHACallisto Supervisor** software is not yet finished, the operating modes are only configurable by dip switches. In few months more functionalities will be available by software.

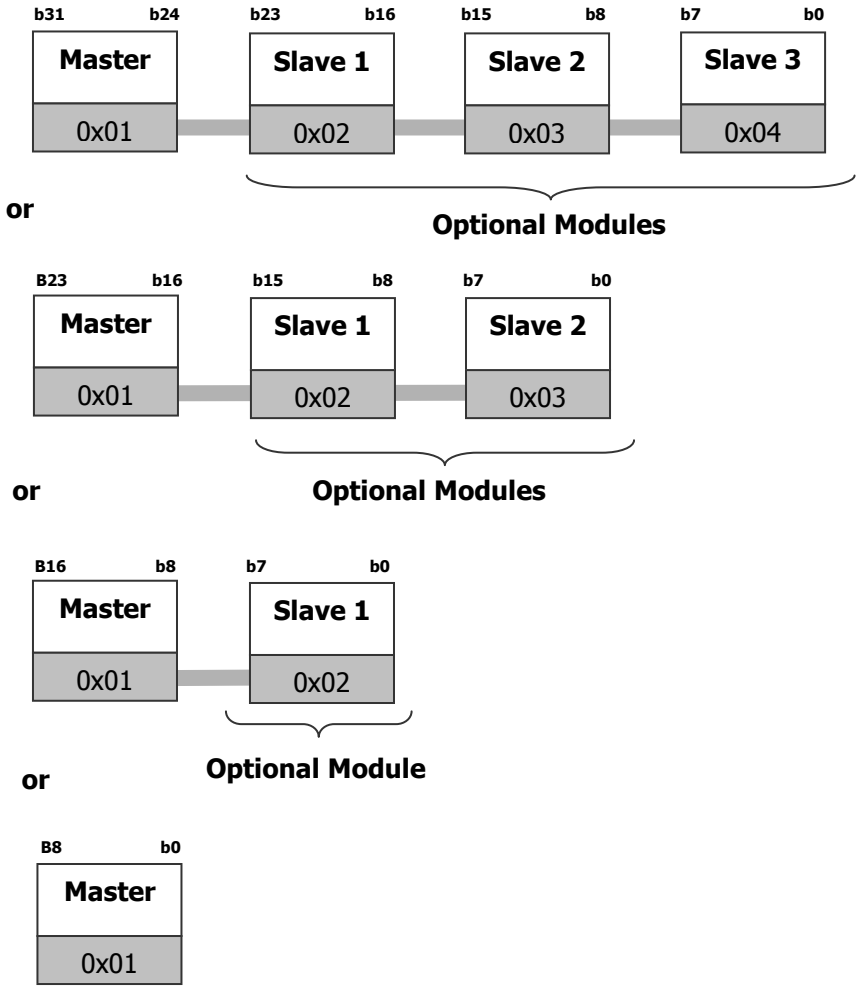
| **MODE 1 : BINARY** | |
|---|---|
| **Description** | The Binary value read at the inputs (I1 – I8) determines the messages to run (see "Message numbering"). |
| **Module configuration:** | **Master**<br>0x01 |
| **DIP switches configuration** | Value : 0x11<br>  |

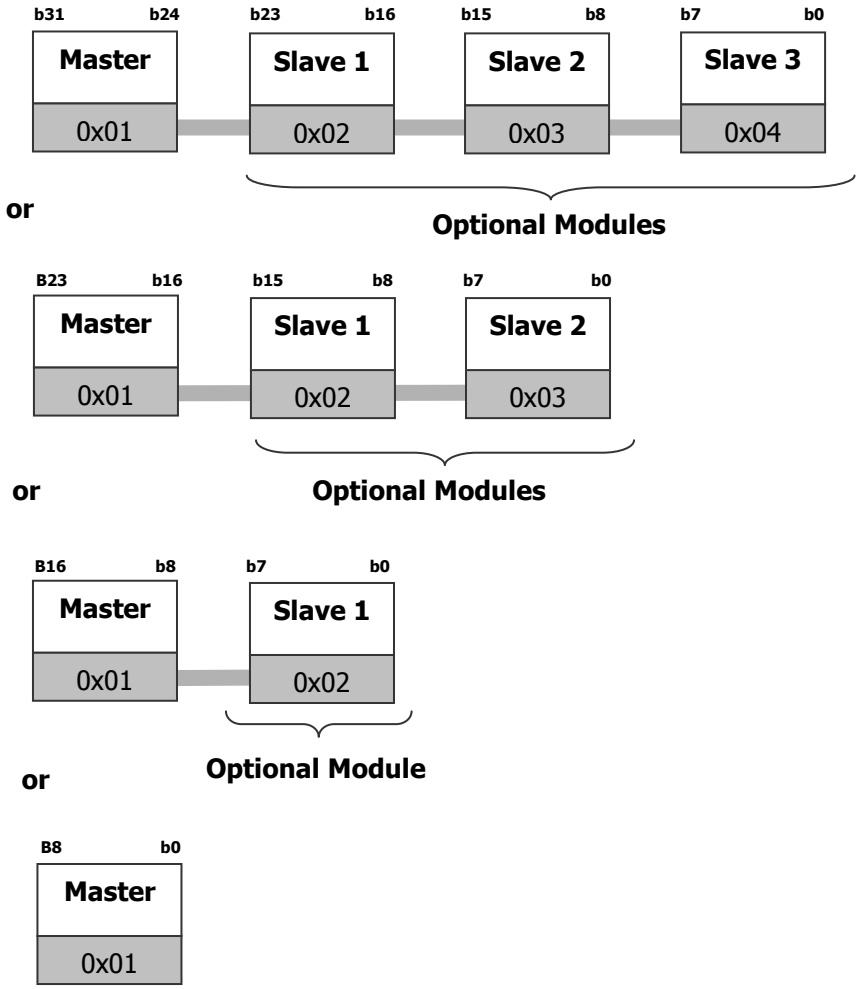
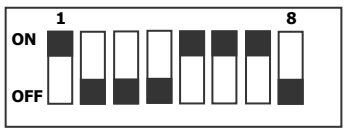
| **MODE 2 : BCD** | |
|---|---|
| **Description** | The Binary value read at the inputs (I1 – I8) determines the messages to run (see "Message numbering"). |
| **Module configuration:**<br>**(modules can be connected in any order)** | **Master**<br>0x01 |
| **DIP switches configuration** | Value : 0x21<br> |

| **MODE 3 : Momentary Triggered** | |
|---|---|
| **Description** | When an input (I1 – I32) goes to a high state (i.e., rising edge), the associated sign message is displayed until a new message is triggered (see "Message numbering"). |
| **Module configuration:** **(modules can be connected in any order)** |  |
| **DIP switches configuration** **(for Master)** | Value : 0x31  |

| **MODE 4 : Discrete Fixed** | |
|---|---|
| **Description** | When an input (I1 – I32) is high, the associated sign message is displayed. It is possible to have several messages running simultaneously on a sign (see "Message numbering"). |
| **Module configuration:** **(modules can be connected in any order)** |  |
| **DIP switches configuration** **(for Master)** | Value : 0x41 |

| **MODE 5 : Counter** | |
|---|---|
| **Description** | In multi-module operating, each module embeds one counter and has the input configuration as describe below:<br>I1: Count up 1<br>I2: Count up 10<br>I3: Count up 100<br>I4: Count down 1<br>I5: Count down 10<br>I6: Count down 100<br>I7: Clear counter<br>I8: Clear counter<br><br>Counter 1 is refresh on sign in variable 'A'<br>Counter 2 is refresh on sign in variable 'B'<br>Counter 3 is refresh on sign in variable 'C'<br>Counter 4 is refresh on sign in variable 'D' |
| **Module configuration:**<br>**(modules can be connected in any order)** |  |
| **DIP switches configuration**<br>**(for Master)** | Value : 0x51<br>  |

| MODE 6 : Binary Variable | |
|---|---|
| **Description** | The Binary value read at the inputs (I1 – I32) is sent to the signs and stored in variable 'A'.<br>The number of modules is determined by the size of variable needed.<br><br>For example a 32 bit configuration (4 modules) result in this input to bit mapping: Master_I8 -> b31 …... Master_I1 -> b25, Slave1_I8->b24…… Slave1_I1->b17…… |
| **Module configuration:**<br>**(modules can be connected in any order)** |  |
| **DIP switches configuration**<br>**(for Master)** | Value : 0x61<br> |

| MODE 7 : BCD Variable | |
|---|---|
| **Description** | The Binary Coded Decimal value read at the inputs (I1 – I32) is sent to the signs and stored in variable 'A'.<br>The number of modules is determined by the size of variable needed.<br><br>For example a 32 bit configuration (4 modules) result in this input to bit mapping: Master_I8 -> b31 …... Master_I1 -> b25, Slave1_I8->b24…… Slave1_I1->b17…… |
| **Module configuration:**<br>**(modules can be connected in any order)** |  |
| **DIP switches configuration**<br>**(for Master)** | Value : 0x71<br>  |

# 5- Message numbering

## 5.1- Discrete Fixed and Momentary Triggered

| IR Remote Message File Letter | ALPHA Messaging Software Message Number (decimal) | CPU Module Message Number (decimal) | Operating Mode: Discrete Fixed (Mode 0) "1" = closed contact | | | | | | | | Input Modules | Operating Mode: Momentary Triggered (Mode 1) "1" = rising edge pulse | | | | | | | | Input Modules |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | I7 | I6 | I5 | I4 | I3 | I2 | I1 | I0 | | I7 | I6 | I5 | I4 | I3 | I2 | I1 | I0 | |
| "A" | 1 | 0 | No input = message "A" displayed on sign | | | | | | | | | Message "A" will be displayed until another message is triggered. Then message "A" will not appear again. | | | | | | | | |
| "B" | 2 | 1 | | | | | | | | 1 | | | | | | | | | 1 | |
| "C" | 3 | 2 | | | | | | | 1 | | | | | | | | | 1 | | |
| "D" | 4 | 3 | | | | | | 1 | | | | | | | | | 1 | | | |
| "E" | 5 | 4 | | | | | 1 | | | | First Module | | | | | 1 | | | | First Module |
| "F" | 6 | 5 | | | | 1 | | | | | | | | | 1 | | | | | |
| "G" | 7 | 6 | | | 1 | | | | | | | | | 1 | | | | | | |
| "H" | 8 | 7 | | 1 | | | | | | | | | 1 | | | | | | | |
| "I" | 9 | 8 | 1 | | | | | | | | | 1 | | | | | | | | |
| "J" | 10 | 9 | | | | | | | | 1 | | | | | | | | | 1 | |
| "K" | 11 | 10 | | | | | | | 1 | | | | | | | | | 1 | | |
| "L" | 12 | 11 | | | | | | 1 | | | | | | | | | 1 | | | |
| "M" | 13 | 12 | | | | | 1 | | | | Second Module | | | | | 1 | | | | Second Module |
| "N" | 14 | 13 | | | | 1 | | | | | | | | | 1 | | | | | |
| "O" | 15 | 14 | | | 1 | | | | | | | | | 1 | | | | | | |
| "P" | 16 | 15 | | 1 | | | | | | | | | 1 | | | | | | | |
| "Q" | 17 | 16 | 1 | | | | | | | | | 1 | | | | | | | | |
| "R" | 18 | 17 | | | | | | | | 1 | | | | | | | | | 1 | |
| "S" | 19 | 18 | | | | | | | 1 | | | | | | | | | 1 | | |
| "T" | 20 | 19 | | | | | | 1 | | | | | | | | | 1 | | | |
| "U" | 21 | 20 | | | | | 1 | | | | Third Module | | | | | 1 | | | | Third Module |
| "V" | 22 | 21 | | | | 1 | | | | | | | | | 1 | | | | | |
| "W" | 23 | 22 | | | 1 | | | | | | | | | 1 | | | | | | |
| "X" | 24 | 23 | | 1 | | | | | | | | | 1 | | | | | | | |
| "Y" | 25 | 24 | 1 | | | | | | | | | 1 | | | | | | | | |
| "Z" | 26 | 25 | | | | | | | | 1 | | | | | | | | | 1 | |
| "a" | 27 | 26 | | | | | | | 1 | | | | | | | | | 1 | | |
| "b" | 28 | 27 | | | | | | 1 | | | | | | | | | 1 | | | |
| "c" | 29 | 28 | | | | | 1 | | | | Fourth Module | | | | | 1 | | | | Fourth Module |
| "d" | 30 | 29 | | | | 1 | | | | | | | | | 1 | | | | | |
| "e" | 31 | 30 | | | 1 | | | | | | | | | 1 | | | | | | |
| "f" | 32 | 31 | | 1 | | | | | | | | | 1 | | | | | | | |
| "g" | 33 | 32 | 1 | | | | | | | | | 1 | | | | | | | | |

# 5.2- BCD and Binary

| IR Remote (up to 76 messages can be programmed) Message File Letter | ALPHA Messaging Software Message Number (decimal) | CPU Module Message Number (decimal) | Operating Mode: BCD (Mode 2) 10's digit 8 | 10's digit 4 | 10's digit 2 | 10's digit 1 | 1's digit 8 | 1's digit 4 | 1's digit 2 | 1's digit 1 | Binary (Mode 3) MSB | | | | | | | LSB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 |
| | | | I7 | I6 | I5 | I4 | I3 | I2 | I1 | I0 | I7 | I6 | I5 | I4 | I3 | I2 | I1 | I0 |
| "A" | 1 | 0 | No input = message "A" displayed on sign | | | | | | | | No input = message "A" displayed on sign | | | | | | | |
| "B" | 2 | 1 | | | | | | | | 1 | | | | | | | | 1 |
| "C" | 3 | 2 | | | | | | | 1 | | | | | | | | 1 | |
| "D" | 4 | 3 | | | | | | | 1 | 1 | | | | | | | 1 | 1 |
| "E" | 5 | 4 | | | | | | 1 | | | | | | | | 1 | | |
| "F" | 6 | 5 | | | | | | 1 | | 1 | | | | | | 1 | | 1 |
| "G" | 7 | 6 | | | | | | 1 | 1 | | | | | | | 1 | 1 | |
| "H" | 8 | 7 | | | | | | 1 | 1 | 1 | | | | | | 1 | 1 | 1 |
| "I" | 9 | 8 | | | | | 1 | | | | | | | | 1 | | | |
| "J" | 10 | 9 | | | | | 1 | | | 1 | | | | | 1 | | | 1 |
| "K" | 11 | 10 | | | | 1 | | | | | | | | | 1 | | 1 | |
| "L" | 12 | 11 | | | | 1 | | | | 1 | | | | | 1 | | 1 | 1 |
| "M" | 13 | 12 | | | | 1 | | | 1 | | | | | | 1 | 1 | | |
| "N" | 14 | 13 | | | | 1 | | | 1 | 1 | | | | | 1 | 1 | | 1 |
| "O" | 15 | 14 | | | | 1 | | 1 | | | | | | | 1 | 1 | 1 | |
| "P" | 16 | 15 | | | | 1 | | 1 | | 1 | | | | | 1 | 1 | 1 | 1 |
| "Q" | 17 | 16 | | | | 1 | | 1 | 1 | | | | | 1 | | | | |
| "R" | 18 | 17 | | | | 1 | | 1 | 1 | 1 | | | | 1 | | | | 1 |
| "S" | 19 | 18 | | | | 1 | 1 | | | | | | | 1 | | | 1 | |
| "T" | 20 | 19 | | | | 1 | 1 | | | 1 | | | | 1 | | | 1 | 1 |
| "U" | 21 | 20 | | | 1 | | | | | | | | | 1 | | 1 | | |
| "V" | 22 | 21 | | | 1 | | | | | 1 | | | | 1 | | 1 | | 1 |
| "W" | 23 | 22 | | | 1 | | | | 1 | | | | | 1 | | 1 | 1 | |
| "X" | 24 | 23 | | | 1 | | | | 1 | 1 | | | | 1 | | 1 | 1 | 1 |
| "Y" | 25 | 24 | | | 1 | | | 1 | | | | | | 1 | 1 | | | |
| "Z" | 26 | 25 | | | 1 | | | 1 | | 1 | | | | 1 | 1 | | | 1 |
| "a" | 27 | 26 | | | 1 | | | 1 | 1 | | | | | 1 | 1 | | 1 | |
| "b" | 28 | 27 | | | 1 | | | 1 | 1 | 1 | | | | 1 | 1 | | 1 | 1 |
| "c" | 29 | 28 | | | 1 | | 1 | | | | | | | 1 | 1 | 1 | | |
| "d" | 30 | 29 | | | 1 | | 1 | | | 1 | | | | 1 | 1 | 1 | | 1 |
| "e" | 31 | 30 | | | 1 | 1 | | | | | | | | 1 | 1 | 1 | 1 | |
| "f" | 32 | 31 | | | 1 | 1 | | | | 1 | | | | 1 | 1 | 1 | 1 | 1 |
| "g" | 33 | 32 | | | 1 | 1 | | | 1 | | | | 1 | | | | | |
| "h" | 34 | 33 | | | 1 | 1 | | | 1 | 1 | | | 1 | | | | | 1 |
| "i" | 35 | 34 | | | 1 | 1 | | 1 | | | | | 1 | | | | 1 | |
| "j" | 36 | 35 | | | 1 | 1 | | 1 | | 1 | | | 1 | | | | 1 | 1 |
| "k" | 37 | 36 | | | 1 | 1 | | 1 | 1 | | | | 1 | | | 1 | | |
| "l" | 38 | 37 | | | 1 | 1 | | 1 | 1 | 1 | | | 1 | | | 1 | | 1 |
| "m" | 39 | 38 | | | 1 | 1 | 1 | | | | | | 1 | | | 1 | 1 | |
| "n" | 40 | 39 | | | 1 | 1 | 1 | | | 1 | | | 1 | | | 1 | 1 | 1 |
| "o" | 41 | 40 | | 1 | | | | | | | | | 1 | | 1 | | | |
| "p" | 42 | 41 | | 1 | | | | | | 1 | | | 1 | | 1 | | | 1 |
| "q" | 43 | 42 | | 1 | | | | | 1 | | | | 1 | | 1 | | 1 | |

# 6- Technical characteristics

## 6.1- ALPHACallisto power supply

### ALPHACallisto module

| Characteristics | Value |
|---|---|
| Nom DC voltage | +5Vdc (-/+10%) |
| Nom/Max currant consumption | 300mA / 500mA |
| Nom/Max PWS consumption | 1.5W / 2.5W |

### ALPHACallisto adaptator

| Characteristics | Value |
|---|---|
| Nom AC voltage | 90 / 264Vac |
| Nom/Max currant consumption | 200mA / 400mA |
| Nom/Max PWS consumption | 5W / 10W |
| Frequency | 47 / 63Hz |

## 6.2- Discrete inputs

### PWS input characteristics

| Characteristics | Value |
|---|---|
| Min/Nom/Max VDC voltage | 12Vdc / 24Vdc / 36Vdc |
| Min/Nom/Max VAC voltage | 12Vac / 24Vac / 36Vac |
| Min/Nom/Max operating currant | 32mA / 160mA / 300mA |

### Input characteristics

| Characteristics | Value |
|---|---|
| Input impedance | 3300 Ohms |
| Min/Nom/Max operating voltage | 12Vdc / 24Vdc / 36Vdc |
| Min/Nom/Max operating currant | 1mA / 5mA / 9mA |
| Refresh frequency | 5 Hz |

## 6.3- Operating characteristics

| Characteristics | Value |
|---|---|
| **Storage temperature** | **-40 -> 85°C** |
| **Operating temperature** | **-20 -> 70°C** |
| **Humidity** | **10 -> 95% non condensate** |
| **CEM standard** | **Compliant** EN 61000-6-2 (01) - EN 61000-6-4 (01)<br>EN 61000-3-2 (00) - EN 61000-3-3 (94) + A1 (01)<br>EN 300 220-1 (ed 2000) - EN 301 489-1 (v1.4.1) |
| **Electrical security standard** | **Compliant** EN 60950-1 (ed 2000) |

www.led-laufschriften.de
Siegfried Behrend
Erfurterstraße 17-35039 Marburg
Tel.05681 6185 Mobil 0171 7724187
Fax 05681 609189
E-Mail:behrend-automaten@t-online.de